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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,953	11/14/2003	Jeong-Seon Kim	1349.1332	7774
21171	7590	09/29/2005	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			DICT, RACHEL S	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 09/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/706,953	KIM ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Rachel Dicht	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,8,9,11 and 13-15 is/are rejected.
- 7) ☒ Claim(s) 2,3,5-7,10 and 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4, 8, 9, 11, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Browning et al. (US Pat. No. 6,652,072) in view of Tamura et al. (US Pat. No. 6,183,066).

In regard to:

Claim 1:

Browning et al. teaches a flexible printed circuit board (33, Fig. 5) connected to a printer head having at least one heater discharging ink (column 5 line 67 to column 6 line 1), the flexible printed circuit board comprising: at least one voltage supplying terminal (P1-P16, Fig. 5) selectively supplying an operating voltage to the at least one heater in response to receiving a printing command signal from a printer (refer to column 6 lines 20-30); at least one first cable (77, Fig. 5) connected at each end to the at least one voltage supplying terminal and at least one first bonding pad (74, Fig. 5), respectively, transferring the operating voltage to the at least one heater; and at least one grounded terminal (TG1 and TG2, Fig. 5).

It is noted however, that Browning et al. does not teach at least one second cable connected at each end to the at least one grounded terminal and at least one second bonding pad, respectively, wherein the at least one second cable is divided into at least two portions at a predetermined position and a first portion of the at least two divided portions is provided along one side of the at least one first cable, and a second portion of the at least two divided portions is provided along the other side of the first cable.

However, Tamura et al. teaches at least one second cable (3, Fig. 2) connected at each end to the at least one grounded terminal and at least one second bonding pad (5, Fig. 2), respectively, wherein the at least one second cable (4, Fig. 2) is divided into at least two portions at a predetermined position and a first portion of the at least two divided portions is provided along one side of the at least one first cable (3, Fig. 2), and a second portion of the at least two divided portions is provided along the other side of the first cable.

Claim 4:

The device of Browning et al. DIFFERS from claim 4 in that it fails to teach a flexible printed circuit board wherein the ends of the at least one first (3, Fig. 2) and second cables connected to the at least one first and second bonding pads, respectively, are each divided into at least two portions connected to the respective bonding pads.

However, Tamura et al. teaches a flexible printed circuit board (1, Fig. 2) wherein the ends of the at least one first (3, Fig. 2) and second (4, Fig. 2) cables connected to the at least one first and second bonding pads (5, Fig. 2), respectively, are each divided into at least two portions connected to the respective bonding pads (refer to Fig. 2).

Claim 8:

The device of Browning et al. DIFFERS from claim 8 in that it fails to teach the flexible printed circuit board wherein the at least one first and second bonding pads are comprised of aluminum.

However, Tamura et al. discloses the claimed invention except for the first and second bonding pads being comprised of aluminum. It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate bonding pads that are comprised of aluminum, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use for the purpose of better electrical connectivity. *In re Leshin*, 125 USPQ 416.

Claim 9:

The device of Browning et al. DIFFERS from claim 9 in the fact that it fails to teach a flexible printed circuit board wherein the at least one first and second cables are bonded to the at least one first and second bonding pads, respectively, by ultrasonic fusing.

However, the method of forming the device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

Claim 11:

Browning et al. teaches a flexible circuit board connected to a printer head, comprising: voltage connection lines (77, Fig. 5) supplying voltage to the printer head; and grounding connection lines (79, Fig. 5) providing grounding to the printer head (refer to column 5 lines 7-35).

It is noted, however, that Browning et al. fails to teach wherein the grounding connection lines are each divided into at least two portions, and are provided in parallel along both sides of the respective voltage connection lines, separated from the voltage connection lines by a predetermined distance.

However, Tamura et al. teaches wherein the grounding connection lines (4, Fig. 2) are each divided into at least two portions, and are provided in parallel

along both sides of the respective voltage connection lines (3, Fig. 2), separated from the voltage connection lines by a predetermined distance.

Claims 14 and 15:

Browning et al. teaches a printer having the printer head connected to the flexible printed circuit board to transfer signals to the printer head to use in printing (refer to column 7 lines 7-18).

Therefor it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Browning et al. to incorporate a second cable divided into at least two portions extending on both sides of the first cable as taught by Tamura et al. for the purpose of reducing electricity loss and keeping the temperature of the recording head within a reasonable level.

***Allowable Subject Matter***

3. Claims 2, 3, 5-7, 10, 12, and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the allowance of claims 2, 3, 5-7, 10, 12, and 13 is the inclusion of the limitations of:

Claim 2:

The flexible printed circuit board wherein a distance between the first cable and the first portion, and a distance between the first cable and the second portion, are 30  $\mu\text{m}$ -300  $\mu\text{m}$ .

Claim 3:

The flexible printed circuit board wherein in response to the first and the second bonding pads being distributed in a predetermined ratio and provided to a first side and a second side facing the first side on a printer head substrate, a separating distance between the first and the second cables connected to the first and the second bonding pads on the first side is different from a separating distance between the first and the second cabled connected to the first and the second bonding pads on the second side.

Claim 5:

The flexible printed circuit board wherein the ends of the at least one first and second cables connected to the at least one first and second bonding pads, respectively, are coated with a second material other than a first material which comprises the cables.



Claim 7:

The flexible printed circuit board wherein one side of each of the at least one voltage supplying terminal and the at least one grounded terminal is plated to electrically contact the printer.

Claim 10:

The flexible printed circuit board wherein an inductance is reduced by reduction of the predetermined distance separating the at least one first and second cables.

Claim 12:

The flexible printed circuit board wherein an impedance formed on the flexible printed circuit board is adjusted by adjusting the predetermined distance between the grounding connection lines and the voltage connection lines.

Claim 13:

The flexible printed circuit board wherein leads of the voltage and grounding connection lines connecting the connection lines to the printer head are each divided into at least two portions, and the at least two portions are bonded to the printer head.

**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rachel Dicht whose telephone number is 571-272-8544. The examiner can normally be reached on 7:00 am - 3:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on 571-272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RSD



September 21, 2005



**MANISH S. SHAH**  
**PRIMARY EXAMINER**